

Remarks

Applicants have amended Claims 1, 4, 7, 9 and 12 and cancelled Claim 3.

Applicants have amended the Specification to delete piperylene as a chain transfer agent and Applicants submit inclusion of piperylene as a chain transfer agent was a typographical error. Applicants submit no new matter has been added by the present amendment and support for the present amendments can be found generally throughout the Specification, including at page 8 lines 3-22.

Provisional Double Patenting Rejection

Claims 1-12 stand provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over Claims 1-8 and 12-12 of co-pending Application No. 10/436,558.

Both the present application and Application No.10/436,558 are pending. Allowable subject matter, notwithstanding the provisional obviousness-type double patenting rejection, has not been indicated in either application. Where a provisional rejection, under the judicially created doctrine of obviousness-double patenting is made between two applications, MPEP § 804(I)(B) states that, "if the 'provisional' double patenting rejection in one of the application is the only rejection remaining in that application, the examiner should then withdrawal that rejection and permit the application to issue as a patent, thereby converting the 'provisional' double patenting rejection in the other application(s) into a double patenting rejection at the time the one application issues as a patent." Therefore, it is no evident which of the pending application will become allowable first, and any action by Applicant with regard to this provisional rejection is premature.

Claims Rejection under 35 U.S.C. § 103(a)

Claims 1-12 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Walker, et al. (U.S. Patent No. 3,548,080). Applicants respectfully traverse this ground of rejection.

Walker, et al. discloses vulcanizable compositions comprising a copolymer of an isoolefin, an aromatic divinyl compound and, optionally an aliphatic diene, together with a free-radical curing agent. Preferably, the compositions of Walker, et al. also comprise a rubbery or resinous polymer vulcanizable by free-radical curing agents.

As discussed in Walker, et al. it is well known that butyl rubber is degraded by free-radical generating curing agents and polyethylene (i.e. a rubber polymer vulcanizable by free-radical curing agents) is curable by peroxide but not by commonly used curatives for butyl compounds. Due to this knowledge, vulcanization of butyl-rubber polyethylene blends has been the subject of much research.

Walker, et al. discloses the covulcanization of polyethylene and a specific type of butyl rubber using a peroxide curing agent. According to Walker, et al. the specific butyl rubber is prepared by copolymerizing 80-99.8% of isobutylene, 0 to 19.8% of an aliphatic diene (such as isoprene, piperylene, dimethyl butadiene and methyl pentadiene) and 0.2 to 4% of a divinyl aromatic compound.

Applicants submit, "[t]o establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. In re Royka, 490 F.2d 981, 180 USPQ 580 (Fed. Cir. 1974)". Applicants also respectfully submit that "in order to establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference. Second, there must be a reasonable expectation of success. Finally, the prior art references must teach or suggest all the claims limitations. The teachings or suggestions to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicants' disclosure." See MPEP § 2142, citing In re Vaeck, 947 F.2d 488, 20 USPQ 2d. 1438 (Fed. Cir. 1991).

Applicants submit Walker, et al. fails to teach all the features of the claimed invention and further Applicants submit Walker, et al. fails to suggest or motivate

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one skilled in the art to modify the teachings of Walker, et al. to arrive at the instant invention with a reasonable expectation of success.

The present invention is directed to a compound comprising:

- a. at least one elastomeric polymer having an average molecular weight M_n of more than 20,000 g/mol and less than 15 wt.% of solid matter insoluble in boiling cyclohexane under reflux for 60 min comprising repeating units derived from at least one C_4 to C_7 isomonoolefin monomer, at least one multiolefin cross-linking agent and at least one chain transfer agent,
- b. at least one filler and
- c. a peroxide curing system,

wherein the polymer does not comprise a conjugated diene, and

wherein the chain transfer agent has a transfer coefficient of at least 10 and is 1-methylcycloheptene, 1-methyl-1-cyclopentene, 2-ethyl-1-hexene, 2,4,4-trimethyl-1-pentene, indene or a mixture thereof. As noted in the Remarks, inclusion of piperylene as a chain transfer agent was an inadvertent typographical error as supported by the other disclosures in the Specification.

Walker, et al. does not teach or suggest a composition comprising an elastomeric polymer of an isomonoolefin monomer, a multiolefin crosslinking agent and a chain transfer agent as presently claimed (transfer coefficient of at least 10 and is 1-methylcycloheptene, 1-methyl-1-cyclopentene, 2-ethyl-1-hexene, 2,4,4-trimethyl-1-pentene, indene or a mixtures thereof). In addition, as further supported by the attached Declaration by Dr. Adam Gronowski, compositions prepared according to the disclosure of Walker, et al. do not have less than 15 wt.% of solid matter insoluble in boiling cyclohexane under reflux for 60 min (i.e. a low gel content).

Accordingly, based at least on the above, Applicants submit Walker, et al. fails to render the present invention obvious and therefore, Applicants request withdrawal of the present rejection and early allowance of the pending claims.

Claims Rejection under 35 U.S.C. § 103(a)

Claims 1-12 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Keller, et al. (U.S. Patent No. 5,021,509,) in view of Walker, et al. (U.S. Patent No. 3,548,080). Applicants respectfully traverse this ground of rejection and incorporate their above comments.

Keller, et al. discloses vulcanizable compositions based on a blend of butyl rubber and minor amounts of a copolymer of ethylene with a lower alkyl acrylate or methacrylate, or a terpolymer of ethylene, a lower alkyl acrylate or methacrylate and acrylic or methacrylic acid. According to Keller, et al. suitable butyl copolymers comprise a minor amount of a conjugated multiolefin (isoprene, butadiene, dimethylbutadiene and piperylene) and a major amount of an isoolefin.

Keller, et al. does not disclose a compound comprising:

- a. at least one elastomeric polymer having an average molecular weight M_n of more than 20,000 g/mol and less than 15 wt.% of solid matter insoluble in boiling cyclohexane under reflux for 60 min comprising repeating units derived from at least one C_4 to C_7 isomonoolefin monomer, at least one multiolefin cross-linking agent and **at least one chain transfer agent**,
- b. at least one filler and
- c. a peroxide curing system,

wherein the polymer does not comprise a conjugated diene, and wherein the chain transfer agent has a transfer coefficient of at least 10 and is 1-methylcycloheptene, 1-methyl-1-cyclopentene, 2-ethyl-1-hexene, 2,4,4-trimethyl-1-pentene, indene or a mixture thereof. As noted in the Remarks, inclusion of piperylene as a chain transfer agent was an inadvertent typographical error as supported by the other disclosures in the Specification.

Applicants further submit the deficiencies in Keller, et al. are not overcome by combination with Walker, et al. As discussed above, Walker, et al. does not teach or suggest compositions according to the present invention, including a composition comprising an elastomeric polymer of an isomonoolefin monomer, a multiolefin crosslinking agent and a chain transfer agent as presently claimed (transfer

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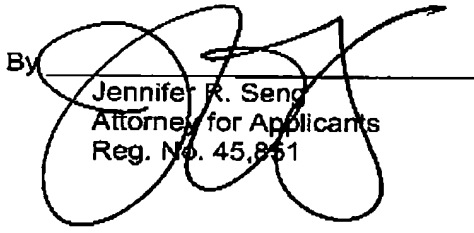
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coefficient of at least 10 and is 1-methylcycloheptene, 1-methyl-1-cyclopentene, 2-ethyl-1-hexene, 2,4,4-trimethyl-1-pentene, indene or a mixtures thereof).

Accordingly, based at least on the above, Applicants submit Keller, et al. in view of Walker, et al. fails to render the present invention obvious and therefore, Applicants request withdrawal of the present rejection and early allowance of the pending claims.

Respectfully submitted,

By



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